Sertifikaat

PATENTKANTOOR

REPUBLIC OF SOUTH AFRICA

Certificate

REPUBLIEK VAN SUID-AFRIKA

PATENT OFFICE

EPARTEMENT VAN HANDEL
N NYWERHEID

DEPARTMENT OF TRADE AND INDUSTRY

Hiermee word gesertifiseer dat
This is to certify that

the documents annexed hereto are true copies of:

Application form P.1, P.2 and provisional specification of South African Patent No. **2002/8170** as originally filed in the Republic of South Africa on **10 October 2002** in the name of **BALMORAL TECHNOLOGIES (PROPRIETARY) LIMITED** for an invention entitled:"**METHOD OF PRODUCING A HYDRAULIC BINDER OR THERMOPLASTIC CONTAINING PRODUCT**".

PRIORITY DOCUMENT
SUBMITTED OR TRANSMITTED IN
COMPLIANCE WITH
RULE 17.1(a) OR (b)

TORIA in die Republiek van Suid-Afrika, hierdie **13th** dag van **November 2003**
in the Republic of South Africa, this day of

Registrateur van Patente

REPUBLIC OF SOUTH AFRICA
PATENTS ACT, 1978

APPLICATION FOR A PATENT
AND ACKNOWLEDGEMENT OF RECEIPT
(Section 30 (1) – Regulation 22)

FORM P.1

REVENUE

10.10.

R 0060.00

HASR 711

REPUBLIEK VAN SUID AFRIKA

The granting of a patent is hereby requested by the undermentioned applicant on the basis of the present application filed in duplicate

OFFICIAL APPLICATION NO.		S & F REFERENCE
21 01	2002/8170	PA134053/P

FULL NAME(S) OF APPLICANT(S)	
71	BALMORAL TECHNOLOGIES (PROPRIETARY) LIMITED

ADDRESS(ES) OF APPLICANT(S)	
	BUILDING 16, CSIR CAMPUS, MEIRING NAUDE ROAD, SCIENTIA, PRETORIA, GAUTENG, SOUTH AFRICA

TITLE OF INVENTION	
54	METHOD OF PRODUCING A HYDRAULIC BINDER OR THERMOPLASTIC CONTAINING PRODUCT

THE APPLICANT CLAIMS PRIORITY AS SET OUT ON THE ACCOMPANYING FORM P.2. THE EARLIEST PRIORITY CLAIM IS:

COUNTRY: NIL NUMBER: NIL DATE: NIL

~~THIS APPLICATION IS FOR A PATENT OF ADDITION TO PATENT APPLICATION NO.~~

21	01	

~~THIS APPLICATION IS A FRESH APPLICATION IN TERMS OF SECTION 37 AND IS BASED ON APPLICATION NO.~~

21	01	

THIS APPLICATION IS ACCOMPANIED BY:

- ☒ 1. A single copy of a provisional specification of 7 pages.
- ☒ 2. Drawings of 2 sheets.
- ☐ 3. Publication particulars and abstract (Form P.8 in duplicate).
- ☐ 4. A copy of Figure of the drawings (if any) for the abstract.
- ☐ 5. Assignment of invention.
- ☐ 6. Certified priority document.
- ☐ 7. Translation of the priority document.
- ☐ 8. Assignment of priority rights.
- ☐ 9. A copy of the Form P.2 and the specification of S.A. Patent Application No .
- ☐ 10. Declaration and power of attorney on Form P.3.
- ☐ 11. Request for ante-dating on Form P.4.
- ☐ 12. Request for classification on Form P.9.
- ☒ 13. Form P.2 in duplicate.
- ☐ 14. Other.

74 ADDRESS FOR SERVICE: SPOOR & FISHER, SANDTON

Dated: 10 October 2002

SPOOR & FISHER
PATENT ATTORNEYS FOR THE APPLICANT(S)

RECEIVED

REGISTRAR OF PATENTS

REPUBLIC OF SOUTH AFRICA | REGISTER OF PATENTS | PATENTS ACT, 1978

OFFICIAL APPLICATION	LODGING DATE: PROVISIONAL	ACCEPTANCE DATE
21 01, 2002/7870	22 10 OCT 2002	47
INTERNATIONAL CLASSIFICATION	**LODGING DATE: COMPLETE**	**GRANTED DATE**
51	23	

FULL NAME(S) OF APPLICANT(S)/PATENTEE(S)

71 BALMORAL TECHNOLOGIES (PROPRIETARY) LIMITED

APPLICANTS SUBSTITUTED: | **DATE REGISTERED**

71

ASSIGNEE(S) | **DATE REGISTERED**

71:

FULL NAME(S) OF INVENTOR(S)

72 SYMONS, MICHAEL WINDSOR

PRIORITY CLAIMED	COUNTRY	NUMBER	DATE
N.B. Use International abbreviation for country (see Schedule 4)	33 NIL	31 NIL	32 NIL

TITLE OF INVENTION

54 METHOD OF PRODUCING A HYDRAULIC BINDER OR THERMOPLASTIC CONTAINING PRODUCT

ADDRESS OF APPLICANT(S)/PATENTEE(S)

BUILDING 16, CSIR CAMPUS, MEIRING NAUDE ROAD, SCIENTIA, PRETORIA, GAUTENG, SOUTH AFRICA

ADDRESS FOR SERVICE | **S & F REF**

74 SPOOR & FISHER, SANDTON | PA134053/P

PATENT OF ADDITION NO.	DATE OF ANY CHANGE
61	
FRESH APPLICATION BASED ON	**DATE OF ANY CHANGE**

SPOOR & FISHER

FORM P.6

REPUBLIC OF SOUTH AFRICA
PATENTS ACT, 1978

PROVISIONAL SPECIFICATION

(Section 30(1) – Regulation 27)

OFFICIAL APPLICATION NO.		LODGING DATE	
21 01	2002/8170	22	10 OCTOBER 2002

FULL NAMES OF APPLICANTS

71	BALMORAL TECHNOLOGIES (PROPRIETARY) LIMITED

FULL NAMES OF INVENTORS

72	SYMONS, MICHAEL WINDSOR

TITLE OF INVENTION

54	METHOD OF PRODUCING A HYDRAULIC BINDER OR THERMOPLASTIC CONTAINING PRODUCT

BACKGROUND OF THE INVENTION

This invention relates to a method of producing a product from a flexible open cell polymeric foam element and an inorganic binder or a thermoplastic material, and to the product so made, and is an addition to, improvement in or modification of the inventions described in South African Patent Applications Nos 2002/5395, 2002/5960 and 2002/6532.

SUMMARY OF THE INVENTION

According to a first aspect of the invention there is provided a method of producing a product from:

(a) a flexible open cell polymeric foam element; and

(b) a binder selected from:

  (i) a hydraulic binder slurry; or

  (ii) a mixture of a pozzolan and either lime or Portland cement in the form of a slurry;

(iii) a synthetic geopolymer precursor slurry; or

(iv) a thermoplastic material in liquid form;

which includes the steps of:

(1) introducing the binder into the open cells of the foam element by either:

(i) compressing the foam element to exclude air from the open cells and then releasing the compression with the foam element in contact with the binder so that the binder penetrates and becomes contained in the open cells of the foam element; or

(ii) impregnating the binder into the foam element under pressure so that the binder penetrates and becomes contained in the open cells of the foam element; and

(2) allowing the binder to set or harden and dry to form the product.

According to a second aspect of the invention there is provided a product comprising an open cell polymeric foam element containing a set binder as described above in the open cells. The product is preferably made by the method described above.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a schematic diagram of an embodiment of the method of the invention;

Figures 2a and 2b are schematic diagrams of the preparation of a pipe according to the invention;

Figure 3 is a schematic diagram of the manufacture of a pole according to the method of the invention; and

Figure 4 is a plan view of the pole of Figure 3.

DESCRIPTION OF EMBODIMENTS

The first aspect of the invention is the method of producing a product from a flexible open cell polymeric foam element and a binder.

The first component is the flexible open cell polymeric foam element, and this is described in SA Patent Application No 2002/5395. Further examples are natural or synthetic latexes, the latter being acrylates.

The second component is a binder.

The binder may be a hydraulic binder slurry and this is described in SA Patent Application No 2002/5395 and SA Patent Application No 2002/5960.

The binder may also be a mixture of a pozzolan and either lime or Portland cement in the form of a slurry, or a synthetic geopolymer precursor slurry, and these are described in SA Patent Application No 2002/5960.

The binder may also be a thermoplastic material in liquid form, i.e in molten, solution or emulsion form. Various suitable thermoplastic materials are described in SA Patent Application No 2002/6532.

The first step of the method of the invention is to introduce the binder into the open cells of the foam element. This may be achieved by compression or by impregnation under pressure.

Various techniques of introducing the binder into the open cells of the foam element by compression are described in SA Patent Applications Nos 2002/5395, 2002/5960 and 2002/6532.

As an alternative, the binder may be introduced into the open cells of the foam element by impregnating the binder into the open cells of the foam element under pressure so that the binder penetrates and becomes contained in the open cells of the foam element.

An example of the introduction of a binder into the open cells of a foam element by impregnation under pressure will now be given.

Figure 1 is a schematic diagram of this method of the invention. A length of an open cell polymeric foam element 10 is passed between free rolling feed rollers 12 which have a clutch controlled resistance so as to apply a tension to the open cell polymeric foam element 10. The open cell polymeric foam element 10 is pulled by a perforated feed roller 14, rotating in the direction shown. At the feed roller 14, a binder in slurry or liquid form is impregnated into the open cell polymeric foam element 10 through a feed galley 16 in an assembly 18. As the binder in slurry or liquid form is injected into one side of the open cell polymeric foam element 10, air in the open cells is exhausted from the other side of the open cell polymeric foam element 10.

Optionally, compression rollers 20 may compress the open cell polymeric foam element 10 to ensure uniform wetting and penetration of the binder.

The open cell polymeric foam element 10 now impregnated from one side is then wound around a second perforated feed roller 22, rotating in the opposite direction to the feed roller 14. The feed roller 22 includes a feed galley 24 in an assembly 26 which injects the binder in slurry or liquid form into the opposite side of the open cell polymeric foam element 10, with air again escaping from the side of the open cell polymeric foam element 10 not being impregnated.

The assembly again may include compression rollers 28 to ensure uniform wetting and penetration of the binder.

The impregnated open cell foam element 10 is then deposited onto a conveyor 30.

Adjustable tension rollers 32 control the tension in the open cell polymeric foam element 10 as well as the area of surface contact with the perforated feed rollers 14 and 22.

The binder impregnated into the open cell polymeric foam element 10 is then allowed to set or harden and dry to form the finished product.

As an alternative, the binder may be impregnated under pressure into the open cells of the foam element from one side thereof only, the binder penetrating through the thickness of the foam element.

As indicated in the prior filed applications, before the binder sets or hardens, the foam element containing the binder may be formed into a desired shape. Further examples of this are illustrated in Figures 2a, 2b, 3 and 4.

Referring to Figure 2a, a length of an open cell polymeric foam element 40 impregnated with a binder which has not yet set, is spirally wound onto a removable pipe blank or mandrel 42. When the binder sets or hardens, there is formed a length of a pipe or tube.

The pipe or tube may be used as such, for example, as a drainage pipe for agriculture, as an irrigation pipe, or, the length of pipe may be used as a core for a pipe composite.

The pipe so made has the advantages that it is lightweight, can be produced economically, and yet is effective in use.

Referring to Figure 2b, as an alternative, a length of an impregnated open cell polymeric foam element 44 may have its elongate edges joined together to form a tube which may then be drawn over a former 46. Once the binder has set or harden, the former 46 may be removed leaving a length of a pipe which may be used as described above.

Referring to Figure 3, a length of an impregnated open cell polymeric foam element 50 is rolled into a circular form and then drawn by a line 52 tied at 54 into a spirally wound paper pipe 56 via a feed funnel 58. The pipe 56 may optionally have been pre-impregnated with a thermosetting resin composite to increase its bursting strength. The binder is allowed to set or harden thus forming an elongate element 60 which may be used as a post or pole. In particular, it may be used as a mine support in underground mining, or as support member for signage or the like.

In another embodiment of the invention, when the binder is a hydraulic binder slurry, the hydraulic binder slurry may be foamed by any method known in the art, i.e the use of a pre-formed foam or the use of a foaming agent which foams in situ, to give a lightweight hydraulic binder slurry. The resulting product has a low density and yet a high thermal insulation and thus is suitable for all thermal insulation applications, particularly the insulation of buildings.

Dated this 10th day of October 2002

.....

SPOOR & FISHER
APPLICANT'S PATENT ATTORNEYS

BALMORAL TECHNOLOGIES (PROPRIETARY) LIMITED

PROVISIONAL SPECIFICATION

TWO SHEETS

SHEET ONE

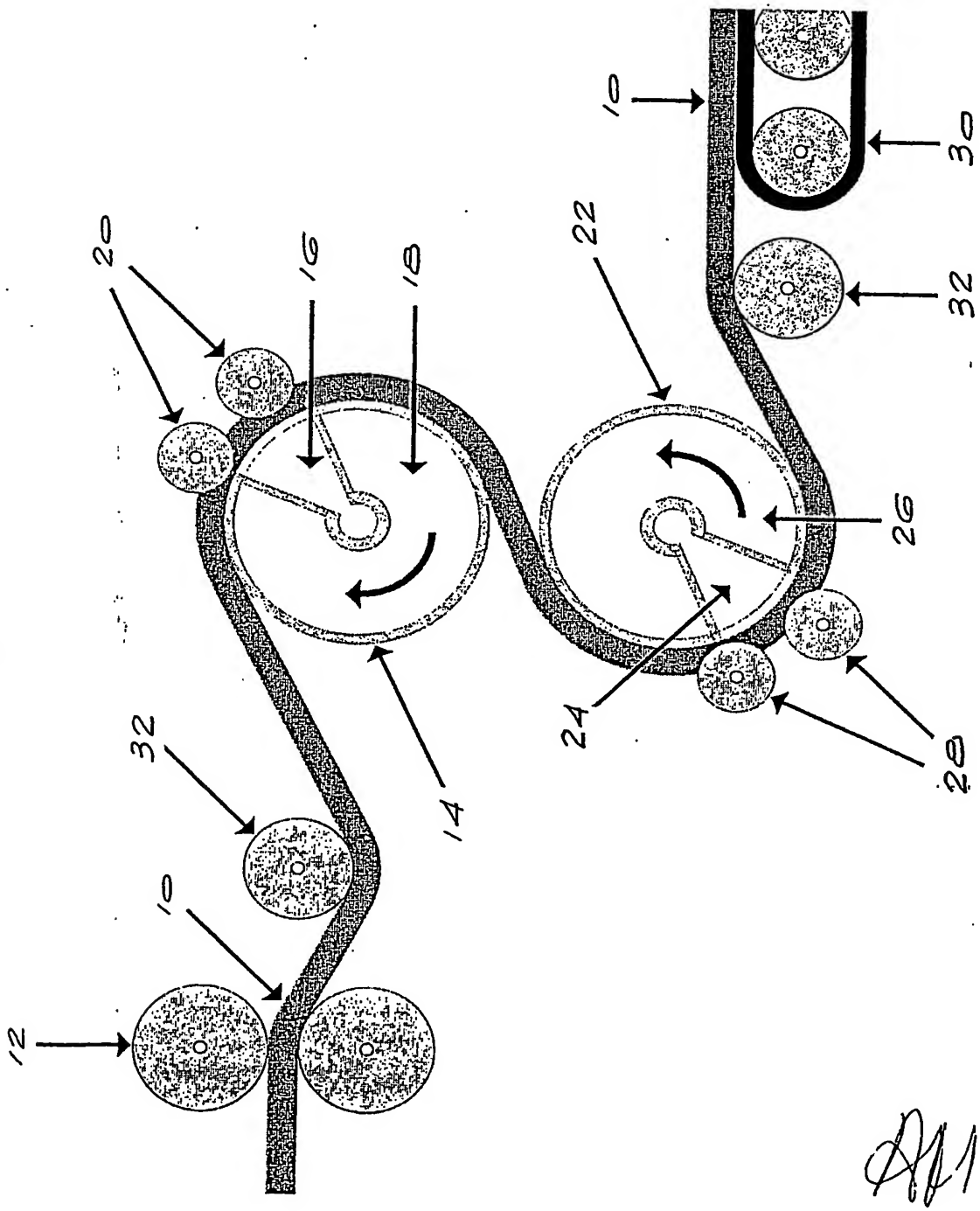

FIG 1

SPOOR & FISHER

Applicant's Patent Attorneys

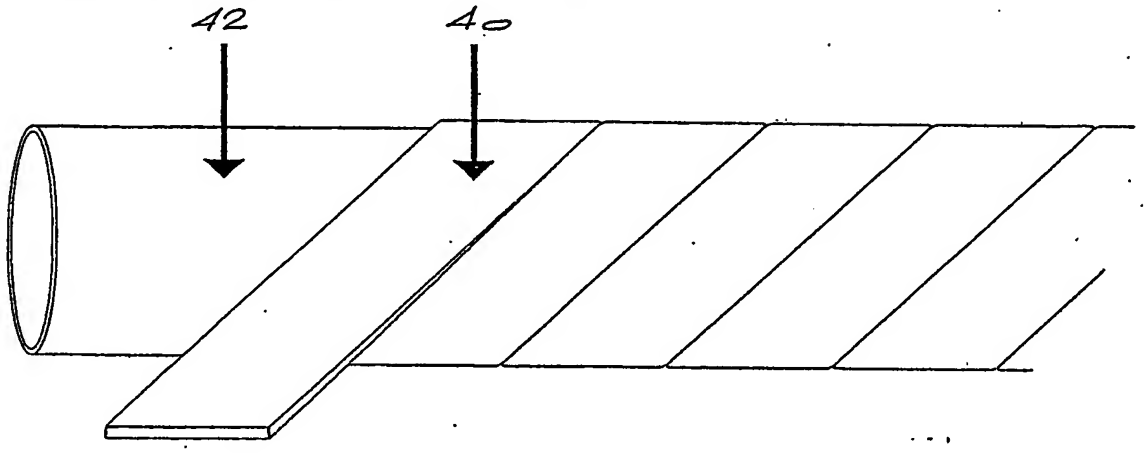

Fig 2a

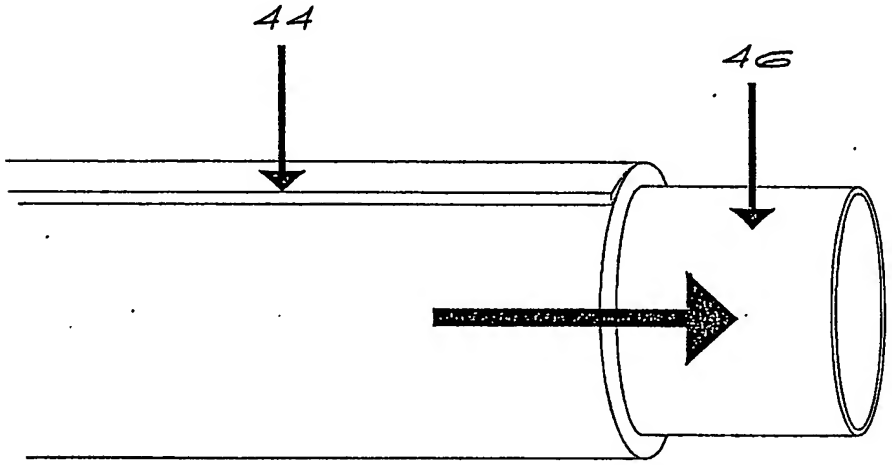

Fig 2b

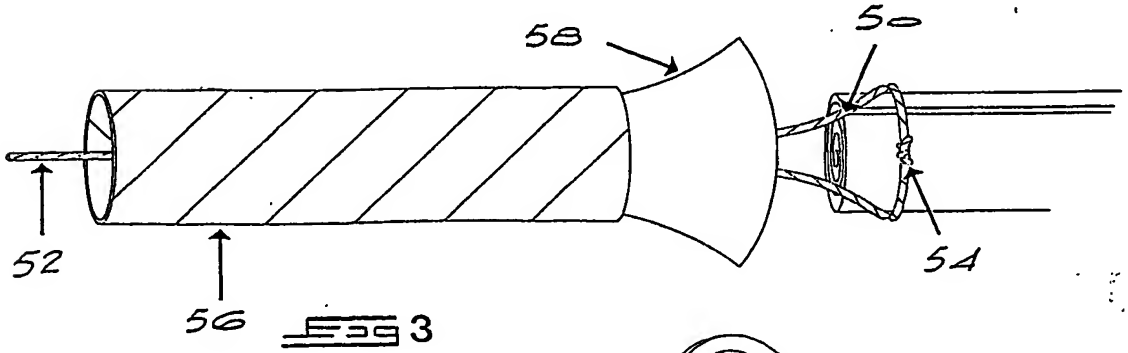

Fig 3

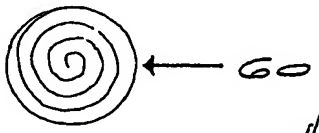

Fig 4

SPOOR & FISHER
Applicant's Patent Attorneys

This Page is Inserted by IFW Indexing and Scanning Operations and is not part of the Official Record

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☐ BLACK BORDERS
- ☐ IMAGE CUT OFF AT TOP, BOTTOM OR SIDES
- ☐ FADED TEXT OR DRAWING
- ☐ BLURRED OR ILLEGIBLE TEXT OR DRAWING
- ☐ SKEWED/SLANTED IMAGES
- ☑ COLOR OR BLACK AND WHITE PHOTOGRAPHS
- ☐ GRAY SCALE DOCUMENTS
- ☑ LINES OR MARKS ON ORIGINAL DOCUMENT
- ☐ REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY
- ☐ OTHER: _____

IMAGES ARE BEST AVAILABLE COPY.

As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.